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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,528	08/22/2006	Saito Shinichiro	NAKAI-005US	3576

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EXAMINER	
MCKENZIE, THOMAS B	

ART UNIT	PAPER NUMBER
1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,528	SHINICHIRO ET AL.	
	Examiner	Art Unit	
	THOMAS BENNETT MCKENZIE	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. In light of the current amendments, the objection to Paragraph 12 of the Specification and **claim 12** are withdrawn.

2. Additionally, in light of the claim amendments to Application 11/663,673 and to instant application, the Provisional Obvious-Type Double Patenting rejection is withdrawn.

3. Applicant's arguments with respect to **claims 1-12** have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochi et al, USP 6,149,713 (Ochi).

7. Regarding **claim 1**, Ochi substantially teaches:

8. a system for use with a cement kiln which produces exhaust gas and exhaust particles, each particle defining a particle size (column 4, lines 45-50), the system comprising:

9. an air bleed means for bleeding a kiln exhaust gas passage, which runs from an end of a cement kiln to a bottom cyclone (as seen by the arrows of figure 1; column 4, lines 30-55), of a part of a combustion gas including fly ash and sulfur dioxide (column 1, lines 1-15), the air bleed means receiving the kiln exhaust from the cement kiln (as seen by the arrows in figure 1);

10. a separating means for separating dust in the gas bled by the air bleed means into coarse and fine particles (figure 1, part 4; column 4, lines 45-50); and

11. a wet dust collector receiving the fine particles and the exhaust gas from the separating means (figure 1, part 5; column 4, lines 50-55), the wet dust collector being configured to separate the fine particles from the gas (column 4, lines 50-55), and simultaneously removing sulfur included in the bled gas by allowing the sulfur dioxide in the combustion gas to react with limestone to generate gypsum (column 4, lines 25-40 and column 4, lines 60-68).

12. Although Ochi does not explicitly teach using this apparatus with a cement kiln, Ochi does teach that the raw materials produced by this apparatus can be used in cement manufacturing (column 7, lines 40-45). Since this apparatus generates cement

making materials, the Examiner is substantially interpreting this system to read on a cement kiln.

13. Furthermore, although Ochi does not explicitly teach the combustion gas contains calcium oxide, but instead contains fly ash (column 1, lines 10-15), fly ash is known in the art to contain at least a portion of calcium oxide. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to consider the fly ash described in Ochi to substantially read on calcium oxide.

14. Although Ochi describes a desulfurization process where limestone is added to the absorption tower (column 5, lines 10-20) instead of a process where fine dust particles are used to remove sulfur from the exhaust gas, it would have been obvious to one of ordinary skill in the art at the time of the invention for the calcium oxide contained in the fly ash to react with water in the absorption tower to form calcium hydroxide (since calcium oxide is known in the art to form calcium hydroxide in water). This calcium hydroxide would then react with the sulfur dioxide contained in the gas stream.

15. Regarding **claim 2**, Ochi teaches the concentration of dust leaving the separating means can be adjusted (column 2, lines 50-55) which the examiner substantially interprets to read on a classifier in which the cut size is changeable.

16. Regarding **claim 3**, Ochi substantially teaches the limitations of **claim 1**, as described above. Although Ochi does not explicitly teach the separating means includes a cyclone where the inlet gas velocity is changeable, Ochi does teach a dust separation device (figure 1, part 4). Dust separation devices with adjustable inlet velocities are well known in the art (as evidenced by Callewyn, USP 4,133,658). It

would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the dust separation device of Callewyn with the apparatus of Ochi since the simple substitution of one known element for another is likely to be obvious when predictable results are achieved. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, B.).

17. Regarding **claim 4**, Ochi substantially teaches the wet dust collector is a mixing scrubber (figure 2, part 10; column 5, lines 15-30).

18. Regarding **claim 5**, Ochi substantially teaches the mixing scrubber comprises a circulating liquid tank to which a dust slurry collected by the mixing scrubber is supplied (figure 2, part 14; column 5, lines 25-35) and a circulating system by which a part of the slurry in the circulating liquid tank is returned to the mixing scrubber (column 7, lines 55-65). Although Ochi does not explicitly teach the slurry contains dust, it would have been obvious to one of ordinary skill in the art at the time of the invention for at least a portion of the dust to remain in the slurry since the dust removing mechanisms would not be completely efficient.

19. Regarding **claim 6**, Ochi substantially teaches the limitations of **claim 5** as described above. Although Ochi does not explicitly teach a sulfuric acid supplier for supplying sulfuric acid to the circulating tank, Ochi does teach supplying sulfur oxides to the circulating tank (column 1, lines 10-20 and column 5, lines 15-25). Sulfur oxides dissolved in water are known in the art to form sulfuric acid. Based on this reasoning, the Examiner substantially considers the flue gas inlet section (figure 2, part 11; column 5, lines 15-20) to substantially read on a sulfuric acid supplier.

20. Regarding **claim 7**, Ochi substantially teaches:

21. a method of treating a combustion gas, the combustion gas including a dust (column 1, lines 1-10), the method comprising:

22. bleeding a kiln exhaust gas passage, which runs from an end of a cement kiln to a bottom cyclone (as seen by the arrows of figure 1; column 4, lines 30-55), of a part of the combustion gas including fly ash and sulfur dioxide (column 1, lines 1-15);

23. separating coarse particles in dust in the bled gas (figure 1, part 4; column 4, lines 45-50); and

24. collecting dust from the gas containing fine particles by a wet dust collector with a solvent (figure 1, part 5; column 4, lines 50-55), and simultaneously removing sulfur included in the bled gas by allowing the sulfur dioxide in the combustion gas to react with limestone to generate gypsum (column 4, lines 25-40 and column 4, lines 60-68).

25. Although Ochi does not explicitly teach using this apparatus with a cement kiln, Ochi does teach that the raw materials produced by this apparatus can be used in cement manufacturing (column 7, lines 40-45). Since this apparatus generates cement making materials, the Examiner is substantially interpreting this system to read on a cement kiln.

26. Furthermore, although Ochi does not explicitly teach the combustion gas contains calcium oxide, but instead contains fly ash (column 1, lines 10-15), fly ash is known in the art to contain at least a portion of calcium oxide. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to consider the fly ash described in Ochi to substantially read on calcium oxide.

27. Although Ochi describes a desulfurization process where limestone is added to the absorption tower (column 5, lines 10-20) instead of a process where fine dust particles are used to remove sulfur from the exhaust gas, it would have been obvious to one of ordinary skill in the art at the time of the invention for the calcium oxide contained in the fly ash to react with water in the absorption tower to form calcium hydroxide (since calcium oxide is known in the art to form calcium hydroxide in water). This calcium hydroxide would then react with the sulfur dioxide contained in the gas stream.

28. Regarding **claim 8**, Ochi substantially teaches at least a part of the dust slurry collected by the wet dust collector is added to a cement mill system (column 7, lines 40-45). Additionally, the apparatus of Ochi produces gypsum (column 6, lines 50-55) which is well known in the art as a component of cement.

29. Regarding **claim 9**, Ochi substantially teaches the dust slurry is collected by the wet dust collector is separated into solid and liquid (column 7, lines 25-40). Although Ochi does not explicitly teach a desalted dust cake is added to a cement mill system, Ochi does teach that the dust cake is suitably treated (column 7, lines 30-35) before entering the cement mill system (column 7, lines 40-45). Desalting cement raw materials is well known in the art and it would have been obvious to one of ordinary skill in the art at the time of the invention to perform this treatment of the dust cake in order to improve performance.

30. Regarding **claim 10**, Ochi substantially teaches the limitations of **claim 7**, as described above. Although Ochi does not explicitly teach at least a part of separated brine is added to a cement mill system, Ochi is directed toward using raw materials

generated for use with a cement mill system (column 7, lines 40-45). Separated brine is known in the art as a useful cement mill raw material, and it would have been obvious to one of ordinary skill in the art at the time of the invention to use the separated liquor of Ochi as a raw material for a cement mill.

31. Regarding **claim 11**, Ochi substantially teaches the dust slurry collected by the wet dust collector is separated into solid and liquid (column 7, lines 25-40); separated brine is desalted in a salt recovery process to recover industry salt (column 7, lines 10-15); and treated water after desalting is utilized again as washing water for collection at the wet dust collector (column 7, lines 10-15).

32. Regarding **claim 12**, Ochi substantially teaches:

33. a system for use with a cement kiln which produces exhaust gas and exhaust particles, each particle defining a particle size (column 4, lines 45-50), the system comprising:

34. an air bleed means for bleeding a kiln exhaust gas passage, which runs from an end of a cement kiln to a bottom cyclone (as seen by the arrows of figure 1; column 4, lines 30-55), of a part of a combustion gas including fly ash and sulfur dioxide (column 1, lines 1-15), the air bleed means receiving the kiln exhaust from the cement kiln (as seen by the arrows in figure 1);

35. a circulating liquid tank having a fluid stored therein (figure 2, part 14; column 5, lines 25-35), the fluid defining a fluid pH;

36. a separating means in fluid communication with the circulating liquid tank and the air bleed means (figure 1, part 4; column 4, lines 45-55), the separating means being

configured to receive the kiln exhaust and to define a cut point which is adjustable (column 2, lines 50-55); and

37. a wet dust collector in fluid communication with the adjustable separating means and the circulating liquid tank (figure 2, part 12; column 5, lines 15-20), the wet dust collector receiving the fine particles and exhaust gas from the separating means (figure 1, parts 4, 5 and A2), the wet dust collector being configured to separate the fine particles from the gas (column 5, lines 15-25), and simultaneously removing sulfur included in the bled gas by allowing the sulfur dioxide in the combustion gas to react with calcium hydroxide (column 5, lines 25-40).

38. Although Ochi does not explicitly teach using this apparatus with a cement kiln, Ochi does teach that the raw materials produced by this apparatus can be used in cement manufacturing (column 7, lines 40-45). Since this apparatus generates cement making materials, the Examiner is substantially interpreting this system to read on a cement kiln.

39. Furthermore, although Ochi does not explicitly teach the combustion gas contains calcium oxide, but instead contains fly ash (column 1, lines 10-15), fly ash is known in the art to contain at least a portion of calcium oxide. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to consider the fly ash described in Ochi to substantially read on calcium oxide.

40. Additionally, although Ochi does not explicitly teach the separating means is adjustable, Ochi does teach the dust concentration leaving the separating means is adjusted (column 2, lines 50-55) implying the separating means is adjustable.

41. Although Ochi does not explicitly teach the separating means is configured to control the pH of the fluid in the circulating tank, where the fluid pH decreases as the cut point increases and where the fluid pH increases as the cut point decreases, the separating means is adjustable (for reasons described above) and the dust is assumed to contain calcium oxide (also for reasons described above). Calcium oxide is basic and therefore the fluid pH increases as more is added. The Examiner is interpreting "cut point" as limiting the amount of dust allowed to pass through the separator. Thereby as the cut point increases, the concentration of dust particles entering the fluid decreases. Based on this interpretation, the fluid pH would increase as the cut point decreases.

42. Although Ochi describes a desulfurization process where limestone is added to the absorption tower (column 5, lines 10-20) instead of a process where fine dust particles are used to remove sulfur from the exhaust gas, it would have been obvious to one of ordinary skill in the art at the time of the invention for the calcium oxide contained in the fly ash to react with water in the absorption tower to form calcium hydroxide (since calcium oxide is known in the art to form calcium hydroxide in water). This calcium hydroxide would then react with the sulfur dioxide contained in the gas stream.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents 3,716,387; 4,465,460; 4,469,664; 4,715,811; 4,915,914; 5,100,643; 5,620,667; 5,667,582 and 6,068,822; US Pre-Grant Publication 2002/0009403; 2002/0071801; 2002/0085961; 2002/0168311 and 2003/0175193.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS BENNETT MCKENZIE whose telephone number is (571) 270-5327. The examiner can normally be reached on Monday-Thursday 7:30AM-5:00PM Alt. Friday 7:30AM-4:00PM EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DUANE SMITH can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duane Smith/
Supervisory Patent Examiner, Art Unit 1797

TBM